

# Evaluating nurses' adherence to the seven rights of medication administration in an Indonesian hospital: A cross-sectional study



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## Abstract

**Background:** Patient safety is a critical focus in Indonesia, particularly in medication administration, where adherence to the “seven rights” – the right patient, drug, dose, route, time, documentation, and information – is essential. Despite established protocols, medication errors remain a challenge, highlighting the need for improved adherence among nurses, who are key players in ensuring safety.

**Objective:** This study aimed to assess nurses' adherence to the “seven rights” of medication administration and explore its relationship with nurse characteristics such as age, education, and career level at Bogor Hospital, Indonesia.

**Methods:** A cross-sectional descriptive study was conducted in May 2024 with 35 nurses selected via purposive sampling. Data were collected through non-disclosed observations using a questionnaire of “seven rights of medication administration” based on Bogor Hospital's Standard Operating Procedures. Adherence was evaluated using the Gudman scale. Statistical analyses included descriptive and bivariate (chi-square) tests using SPSS version 23.

**Results:** The majority (57.1%) of nurses partially adhered to the “seven rights,” 25.7% fully adhered, and 17.1% did not adhere. All nurses consistently

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## Article info

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performed key practices such as patient identity verification and medication checking (100%). However, only 57% provided patient education. Career level significantly influenced adherence ( $p = 0.009$ ), with higher-level nurses showing better adherence. Age, gender, and education level showed no significant correlation.

**Conclusion:** While adherence to core protocols was high, gaps in patient education highlight areas for improvement. Targeted training and educational advancements, especially for entry-level nurses, are essential to enhance patient safety and medication administration practices. However, further studies are needed to validate the findings.

## Keywords

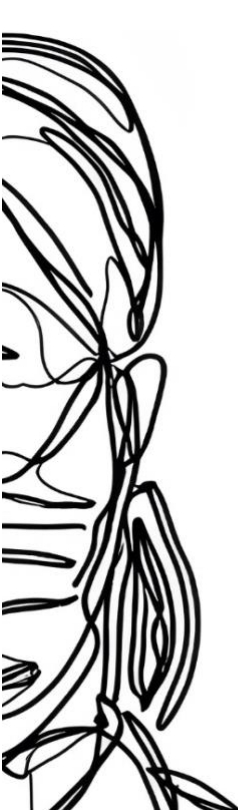
Indonesia; nurses; medication administration; patient safety; medication errors; hospitals; cross-sectional

## Background

Patient safety is a core priority in Indonesian hospitals, aligning with the increasing emphasis on patient-centered care (PCC) advocated by Joint Commission International (JCI) standards. One key element of this approach is the Patient Consent Process (PCP) 4.3, which ensures that patients and their families are given clear, comprehensive information about their condition, proposed treatments, and healthcare practitioners involved. This helps patients make informed decisions and consent to care (JCI, 2020). Establishing strong communication channels is thus a foundational aspect of ensuring patient safety.

To achieve this, hospitals must focus on interconnected components like enhancing quality care, encouraging patient involvement, fostering teamwork, and refining systems and processes. Communication and feedback play a central role in quality improvement, ensuring that all stakeholders – staff, management, leadership, patients, and the wider community – are actively engaged (Baah et al., 2023). This comprehensive approach is critical to fostering a culture of safety.

In Indonesian hospitals, nurses are at the forefront of patient safety efforts, operating within a structured professional career ladder that ranges from Clinical Nurse Level I to Level V (Ministry of Health, 2017). Regardless of their level or educational background, whether holding diplomas or bachelor's degrees, nurses are key players in preventing medication errors. They are tasked with working collaboratively, adhering to guidelines that promote education, training, and standardized procedures such as the "rights" of medication administration (Arabadi et al., 2021). These safeguards are essential in reducing risks associated with medication errors.



For example, many hospitals, including those like Bogor Hospital, implement the “seven rights” of medication administration: ensuring the right patient, drug, dose, route, time, documentation, and information (Uzira et al., 2023). Although variations exist, such as the “six rights” (Noviyanti et al., 2023) or the “nine rights” (Elliott & Liu, 2010), nurses are responsible for overseeing medication management, including monitoring its effectiveness and detecting side effects. Their role in identifying potential errors before administration positions them as a crucial line of defense in medication safety (Safrudin & Milkhatun, 2019).

Despite the implementation of these protocols, medication errors remain a significant issue in Indonesia, contributing to 24.8% of patient safety incidents in public and mental hospitals (Uzira et al., 2023). This reveals a gap between established safety practices and their day-to-day application, highlighting the ongoing challenge of medication safety in healthcare.

However, while the role of nurses in preventing medication errors is well-documented, there is limited research exploring how variations in nurses’ educational backgrounds and professional experience impact their adherence to medication safety protocols in Indonesia. Existing studies have not specifically examined how factors such as clinical experience or educational level influence the frequency of medication errors in hospitals like Bogor Hospital. This presents a significant gap in understanding the relationship between nurses’ career progression and medication safety outcomes.

Our preliminary study using interviews with clinical instructors has revealed that significant medication errors have occurred at Bogor Hospital over the past five years, with variations in education and tenure appearing to play a role. While general literature acknowledges the importance of the “seven rights” of medication administration, this study offers new insights by focusing on how these principles are practically implemented by nurses with differing experience levels. By investigating how adherence to these safety protocols changes with career progression, this research fills a critical gap and aims to inform strategies for improving patient safety outcomes.

This study aimed to evaluate the Medication Administration Practices of Nurses according to the Seven Rights of Medication and determine their correlation with nurse characteristics, including age, educational background, and career level.

## Methods

### Study Design

This descriptive study utilized a cross-sectional design and was conducted at Bogor Hospital in Indonesia.



## Samples/Participants

The study involved 35 nurse respondents who were selected through purposive sampling. This sampling method focused on nurses directly engaged in medication administration. The researcher observed the participants without their knowledge, employing a questionnaire to assess their adherence to the seven rights of medication administration.

## Instruments

Data collection relied on a questionnaire derived from the Standard Operating Procedures of Bogor Hospital. The Gudman scale was utilized to evaluate medication administration practices, with responses scored as 1 for 'Yes' and 0 for 'No.' Key elements assessed included verification of patient identity through either an identity bracelet or the patient's name, confirmation that the medication was checked three times before administration, and validation of drug doses prior to giving the medication. The administration of medications was carefully monitored, ensuring they were given at the correct time and in the appropriate location. For oral medications, the researcher observed the patient until the medication was completely swallowed. For injectable medications, intravenous administration was performed following aseptic techniques for parenteral administration. After medication delivery, the researcher documented the process and provided educational information to the patient regarding the name of the medication, its purpose, expected reactions, side effects, and timing of administration.

## Data Collection

Data were collected by observations in the Lily Room (inpatient ward) from May 17 to May 21, 2024. During this period, nurses were monitored while administering medications, using a questionnaire specifically designed to evaluate their adherence to the seven rights of medication administration.

## Data Analysis

SPSS version 23 was employed to conduct univariate tests, allowing for descriptive analyses of variables such as age, education, gender, career level, and adherence to medication procedures in relation to the seven rights of medication administration. Additionally, bivariate chi-square tests were utilized to examine relationships between these demographic factors and medication administration practices.



## Ethical Considerations

The study received ethical approval from the University of Indonesia Maju Ethics Committee Board (Approval No. 4143/Sket/Ka-Dept/RE/UIMA/V/2024). Confidentiality agreements obtained from the clinical instructor ensured that each participant remained anonymous throughout the research. Observations were conducted during medication administration using the seven rights of medication administration questionnaire, adhering to ethical research practices.

## Results

### Characteristics of the Participants

A total of 35 participants took part in the study. The majority were in the 26-29 age group, with an average age of 26.8 years (SD = 2.5), accounting for 62.9% of the sample. Most respondents held a Diploma III in Nursing, representing 74.3% of the participants. Female nurses made up 57.1% of the sample. Additionally, most respondents (88.6%) were employed as Clinic Nurse I, reflecting a predominance at the entry level of the clinical nursing career path (Table 1).

Table 1 Socio-demographic information of the respondents (N = 35)

Variables	n (%)
<b>Age (years) (Mean = 26.8, SD = 2.5)</b>	
23-25	9 (25.7)
26-29	22 (62.9)
30-32	4 (11.4)
<b>Education Level</b>	
Diploma III of Nursing	26 (74.3)
Bachelor of Nursing	9 (25.7)
<b>Gender</b>	
Male	15 (42.9)
Female	20 (57.1)
<b>Career Level</b>	
Clinical Nurse I	33 (88.6)
Clinical Nurse II	4 (11.4)

### Nurses' Adherence to the Seven Rights of Medication Administration

The research findings indicated that six respondents (17.1%) did not adhere to the seven rights of medication, 20 respondents (57.1%) partially adhered to the seven rights, and nine respondents (25.7%) fully adhered to the seven rights of medication administration.

Table 2 presents the results of nurses' medication administration actions. All 35 nurses (100%) correctly checked the patient's identity, verified the medication three times, calculated the dose, and documented the administration. The majority (86%) administered medication on time, and 83% ensured the medication was given in the appropriate location, including proper techniques





for oral and injectable medications. However, only 57% of nurses provided education to patients regarding the medication, including its name, function, side effects, and administration schedule. While adherence to key protocols was high, patient education was less frequently provided.

**Table 2** Nurses' adherence to medication administration protocols

Observation Action	Correct Action	n (%)
1. The nurse checks the patient's identity (identity bracelet or patient name)	Yes	35 (100%)
2. The nurse checks the medication three times before administration (prescription, pharmacy label, identity)	Yes	35 (100%)
3. The nurse checks or calculates the dose of the medication before administration	Yes	35 (100%)
4. The nurse administers the medication at the prescribed time	Yes	30 (86%)
5. The nurse administers the medication at the appropriate location (oral or injection, with aseptic technique)	Yes	29 (83%)
6. The nurse documents the medication administration after giving the medication	Yes	35 (100%)
7. The nurse provides education regarding the medication (name, function, reactions, side effects, administration schedule)	Yes	20 (57%)

**Table 3** Correlations of age, education, gender, career level, and nurse practices in administering the seven right medications

Variables	Not Appropriate in 7 Right Medication	Not Yet Appropriate in 7 Right Medication	Appropriate in 7 Right Medication	p-value
<b>Age (years)</b> (Mean = 26.8, SD = 2.5)				
23-25	3 (1.5%)	3 (5.1%)	3 (9.0%)	0.437
26-29	3 (3.8%)	14 (12.6%)	5 (5.7%)	
30-32	0	3 (2.3%)	1 (1.0%)	
<b>Education Level</b>				0.219
Diploma III in Nursing	6 (4.5%)	13 (14.9%)	7 (6.7%)	
Bachelor of Nursing	0 (1.5%)	7 (5.1%)	2 (2.3%)	
<b>Gender</b>				0.543
Male	3 (2.5%)	7 (8.6%)	5 (3.9%)	
Female	3 (3.4%)	13 (11.4%)	4 (5.1%)	
<b>Career Level</b>				0.009
Clinical Nurse I	6 (5.5%)	20 (18.3%)	6 (8.2%)	
Clinical Nurse II	0	0	3 (3.0%)	

**Table 3** presents the factors influencing nurses' adherence to the 7 Right Medication practices, focusing on variables such as age, education level, gender, and career stage. Age did not significantly affect medication practices ( $p = 0.437$ ), with similar proportions of nurses in the 23-25, 26-29, and 30-32 age groups demonstrating appropriate or inappropriate practices. Education level also showed no significant impact ( $p = 0.219$ ), with nurses holding a Diploma III in Nursing and a Bachelor of Nursing having similar distributions in their adherence to the 7 Right Medication practices. Gender had no significant effect ( $p = 0.543$ ), as both male and female nurses demonstrated comparable practices. However, the nurse's career level did significantly influence ( $p = 0.009$ ), with Clinical Nurse I nurses (the majority) having less appropriate practices compared

to Clinical Nurse II nurses, who showed better adherence despite fewer numbers. Overall, while age, education, and gender did not significantly influence practices, career stage played a key role in determining the appropriateness of medication administration.

## Discussion

This study's findings highlight several critical aspects of nurses' adherence to the "seven rights" of medication administration and the associated influencing factors. The results also highlight the importance of education, professional experience, and adherence to established protocols in ensuring patient safety and effective healthcare delivery.

The majority of respondents were in early adulthood, demonstrating a high level of compliance with medication administration protocols, aligning with findings from [Safrudin and Milkhatun \(2019\)](#). These results reflect a sense of responsibility among nurses, particularly in ensuring accurate medication administration. Most participants held a Diploma III in Nursing, which is consistent with national trends in Indonesia, where this qualification dominates the nursing profession ([Efendi et al., 2018](#)). While this educational background equips nurses with practical skills, further advancements in nursing education are essential to meet evolving healthcare demands.

Gender did not significantly influence adherence to medication protocols, supporting the idea that professional competence in nursing transcends gender. [Andrew et al. \(2023\)](#) emphasize that nursing roles are influenced by cultural and societal factors. Florence Nightingale's historical contributions highlight the profession's strong association with women.

Medication errors, a key concern in nursing practice, can have severe consequences for patients, families, and healthcare professionals ([Wang et al., 2015](#)). These errors frequently occur during the medication administration process ([Pirinen et al., 2015](#)), emphasizing the need for systematic and skilled practices. This study found gaps in adherence to the "seven rights," particularly in patient education provided by only 57% of nurses. Addressing this gap requires targeted interventions to enhance patient-centered care.

Career progression emerged as a significant factor influencing medication administration practices, with Clinic Nurse II showing better adherence to the "seven rights" than Clinical Nurse I. This finding aligns with research suggesting that clinical experience facilitates the integration of theoretical knowledge and practical skills in the field ([Renolen & Hjälmhult, 2015](#)). Similarly, [Gunawan and Juanamasta \(2022\)](#) note that novice nurses, often holding a Diploma III, benefit



from gaining experience to improve their competency in medication administration.

Nurses must adopt a safe, systematic, patient-centered approach, incorporating essential competencies such as clinical assessment, medication preparation, and patient education. Advanced education, such as a Bachelor of Science in Nursing (BSN), has been shown to enhance these competencies, equipping nurses to meet diverse patient needs and assume leadership roles (Fawaz et al., 2018). BSN/Ners graduates are also more frequently trained in evidence-based practice nursing (EBPN), emphasizing the need to prioritize advanced education in the nursing (Suprapti, 2020).

The study identified several challenges in adhering to standard operating procedures (SOPs) during medication administration. For instance, nurses occasionally failed to ensure patients consumed oral medications or to provide adequate education about potential reactions. Such lapses indicate the complexity of the nursing role, which includes care coordination, symptom management, and interdisciplinary collaboration (Anderson et al., 2024; Karam et al., 2021).

To address these challenges, continuous professional development and adherence to SOPs are crucial. Enhanced supervision, training on emerging technologies, and a focus on patient education can improve medication safety and nursing practices (Abdulmutalib & Safwat, 2020; Stolic et al., 2022). Furthermore, fostering a culture of lifelong learning through training programs and workshops can ensure that nurses remain competent and confident in their roles (Tsegaye et al., 2020; Wondmieneh et al., 2020).

## Limitations

The study was conducted in a single hospital (Bogor Hospital) with a small sample size of 35 nurses, potentially limiting the generalizability of findings to other settings or broader healthcare systems. Also, most participants were entry-level nurses (88.6% at Clinical Nurse I), which may not fully represent variations across all career stages or diverse institutional practices.

## Conclusion

This study reinforces the critical role of professional experience, education, and structured interventions in enhancing medication administration practices. While the study found high compliance with some aspects of the “seven rights,” gaps in patient education and protocol adherence require attention. Advancing nursing education and providing targeted training, particularly for entry-level nurses, are essential for fostering a competent and effective nursing workforce.





By addressing these challenges, healthcare institutions can ensure higher standards of patient safety and quality care. However, further studies are needed to confirm the findings of this study.

#### Declaration of Conflicting Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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#### Authors' Contributions

All authors contributed equally to this study.

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#### Data Availability Statement

The dataset generated during and analyzed during the current study is available from the corresponding author upon reasonable request.

#### Declaration of the Use of AI in Scientific Writing

None.

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